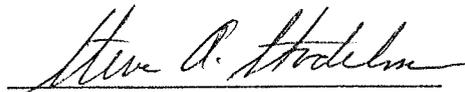


Geotechnical Subsurface Investigation

Fieldcrest Cannon, Inc.
Kannapolis, North Carolina
ENSCI Job #SF04-010

Prepared for
Fieldcrest Cannon, Inc.

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Steven A. Stadelman, P.G.
Geologist

ENSCI Corporation
1108 Old Thomasville Road
High Point, North Carolina 27260
(919) 883-7505

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Executive Summary

In December 1992, Fieldcrest Cannon contracted ENSCI Corporation to conduct subsurface investigations at the Fieldcrest Cannon Plant #1 facility in Kannapolis, North Carolina. The investigation area is the site of a proposed landfill expansion, immediately east-northeast of the existing land-clearing and inert debris landfill.

ENSCI's scope of work was developed in accordance with Title 15A of the North Carolina Administrative Code (NCAC), 13B .0506 in order to provide information which will assist Fieldcrest Cannon in completing an application for the proposed landfill expansion. Site work was performed by ENSCI December 14-18, 1992, and included installing soil borings and performing other investigative activities in order to calculate and compile the following information:

- The static groundwater table (potentiometric surface)
- The seasonal high groundwater table
- The gradient and direction of groundwater flow

Subsurface investigations established the seasonal high groundwater table at approximately 2 feet above the static groundwater table. The direction of groundwater flow was determined to be west-northwest, and the groundwater gradient was determined to be 0.0260 feet per foot.

1. Introduction

ENSCI Corporation was contracted by Fieldcrest Cannon, Inc. to perform geotechnical subsurface investigation of an area of the Fieldcrest Cannon Plant #1 facility in Kannapolis, North Carolina (see **Figure 1**). The investigation area is the site of a proposed landfill expansion immediately east and northeast of the existing land-clearing and inert debris landfill. The purpose of the investigation is to provide data which will assist Fieldcrest Cannon in completing an application for the proposed expansion in accordance with Title 15A of the North Carolina Administrative Code (NCAC), 13B .0506.

ENSCI's scope of work included installing soil borings and performing other site investigation activities in order to calculate and compile the following information:

- The static groundwater surface (potentiometric surface)
- The seasonal high groundwater table
- The gradient and direction of groundwater flow

2. Setting

2.1 Site Location and Description

The Fieldcrest Cannon Plant #1 facility is located at 1 Lake Drive. As it is being proposed, the landfill expansion area is situated on approximately 7-10 acres in the northeastern part of the facility, southwest of the intersection of North Loop Road and Main Street (see **Figure 2**). The area is bounded on the north by North Loop Road, on the south by the Fieldcrest Cannon plant, on the east by Main Street, and on the west and southwest by the existing land-clearing and inert debris landfill. An asphalt parking lot is located in the eastern portion of the expansion area, and a natural gas tank field is located in the west-southwestern portion. An access road leading to the facility from North Loop Road bisects the site.

Runoff from the proposed landfill expansion area drains south-southwest to the Lumber Yard Branch, which flows north-northeast approximately 0.6 miles to Bakers Creek. Bakers Creek flows west approximately 1 mile from this point, where it joins Irish Buffalo Creek, a tributary of the Rocky River.

2.2 Regional Soils and Geology

The 1985 Geologic Map of North Carolina shows the Kannapolis area of Cabarrus County located in the southern part of the Charlotte Belt Hydrogeologic unit in the Piedmont Physiographic Province, which consists predominantly of igneous and meta-igneous rocks. The bedrock in the Kannapolis area is mapped as Pennsylvanian to Permian post-metamorphic intrusions (PPg). These intrusions are commonly medium- to coarse-grained porphyritic acidic igneous rocks ranging from granite to tonalite.

Thick saprolite sequences are common above bedrock in the Piedmont Physiographic Province. Saprolite grades from intensely weathered rock near the surface to slightly weathered rock with increasing depth.

The 1988 Soil Survey for Cabarrus County indicates that soils in the Kannapolis area are dominated by the Cecil soil map unit. Soils in this map unit are typically on gently to strongly sloping landscapes, and have formed in saprolite above acidic igneous and metamorphic bedrock. They are generally well drained with a clayey subsoil.

The proposed landfill expansion site is located in the northeastern corner of Sheet Number 1 of the Soil Survey. Soils at the site have been mapped as the Enon-Urban land complex on 2-10 percent slopes. This complex is characterized by 50-70 percent Enon soil series and 15-35 percent Urban land. The Enon series is typically located on uplands. It is well drained with high shrink-swell capacity and low permeability in a clayey subsoil. Urban lands consist of areas where 85 percent or more of the land surface is covered by asphalt, concrete, and buildings. Precursor soils have commonly been modified or destroyed.

2.3 Regional Hydrogeology

Groundwater in the Charlotte Belt Hydrogeologic unit is typically shallow and commonly located at the interface between saprolite and the subjacent bedrock. Movement of groundwater is controlled by landform topography and the fracture porosity and permeability of saprolite and bedrock. Flow is generally perpendicular to landform contours from high to low elevations.

3. Field Procedures

3.1 Soil Boring Installation and Sampling

ENSCI installed 19 soil borings December 14-18, 1992 (SB-18 through SB-38, see Figure 2). The borings were installed and sampled using the procedure described in Appendix A. They were surveyed along a grid consisting of parallel east-west gridlines located 200 feet apart. The borings were spaced 100 feet apart along each gridline. Variations from this system were required due to the presence of utilities and topographic restrictions.

The soil borings were drilled until the static groundwater table was encountered. Temporary piezometers consisting of 2-inch diameter PVC screen and riser were set into the borings so that groundwater levels could be measured.

3.2 Delineation of the Seasonal High Groundwater Table

Geologic descriptions were performed on samples collected from each soil boring. Green to gray colors and/or the presence of dark gray to black staining were noted, where present. These properties are indicative of chemical changes associated with waterlogging (gleization or gleying). Green and gray staining (gley colors) represent iron reduction or leaching of reduced iron. Dark gray to black staining represents reduction and mobilization of manganese oxides. There is a general correlation between the presence of these properties and the location of the saturated zone. These properties are commonly used to determine the position of the seasonal high groundwater table.

3.3 Measurement of the Potentiometric Surface

Potentiometric head measurements were obtained using a water level meter manufactured by Solinst Canada Ltd. The water level meter is graduated in tenths of a foot and has an electrical probe on the end of the tape, which connects to an audible indicator used to locate the water table.

4. Subsurface Conditions

4.1 Site Soils and Geology

Materials encountered during drilling included highly weathered saprolite, soil, and fill materials consisting of clean fill (disturbed saprolite) and some debris (see Field Drilling Records, Appendix B). Geologic cross-sections (see **Figures 3 and 4**) were constructed from the Field Drilling Records.

Saprolite consisted of highly weathered rock resembling granite, tonalite, and schist. Saprolite was overlain by clean fill and debris.

Soil was identified in borings SB-19, SB-23, SB-26, SB-29, SB-30, SB-31, SB-32, SB-36, and SB-37. Soil matrix colors included red, yellowish red, reddish yellow, and gray. Textures included clay, silty clay, sandy clay loam, and loam. These properties are representative of subsoil horizons, indicating that the upper soil horizons have been removed. The presence of gray matrix colors and gray mottles indicate slow subsoil permeability. These properties are consistent with those of the Enon soil series described in previous drilling. (See the August 10, 1992 Geotechnical Subsurface Investigation report, which was developed for the demolition landfill immediately west of the subject site). Soil thicknesses ranged from 6 feet in SB-19 and SB-29 to approximately 20 feet in SB-37.

Fill materials were encountered in SB-19, SB-20, SB-22, SB-24, SB-25, SB-26, SB-27, SB-28, SB-31, SB-33, SB-34, and SB-35. These materials consisted primarily of clean fill (disturbed saprolite). Debris, consisting of stone, gravel, concrete, asphalt, brick, and plant material, was observed in minor amounts. A wide range of colors and textures were noted. In several locations, clean fill exhibited gray to green colors. The greatest thickness of fill materials was 23 feet in SB-34. An isopach map (**Figure 5**) was constructed to illustrate the distribution of existing fill materials. Debris is indicated on the cross section illustrations (Figure 4).

4.2 Hydrogeology

4.2.1 Potentiometric Surface

Depth to groundwater data were collected on December 22, 1992. The depth to groundwater ranged from 1.90 feet in SB-25 to 31.23 feet in SB-32 (see Table 1). In general, the static water table was deeper at higher positions on the topography and shallower at lower positions.

In order to map the potentiometric surface and determine groundwater flow direction, depth to groundwater measurements were subtracted from the piezometer head elevations to determine the potentiometric head (static water level) elevations (see Table 1, located on the following page). A nail in the base of a telephone pole along North Loop Road was used as an elevation control (Z-axis).

Based on the information presented in Table 1, ENSCI developed a map of the potentiometric surface (see **Figure 6**). The gradient of the potentiometric surface was steepest at the western part of the site, near the Lumber Yard Branch.

As illustrated in Table 1, the potentiometric head was significantly shallower in SB-34 than in adjacent soil borings. The anomalously high water level is most likely an artifact of storm drains located in the vicinity of SB-34. Also, the fill at SB-34 consists of clays to depths of at least 23 feet. This material may be acting as an aquitard resulting in a perched water table. As a result, depth to groundwater data from SB-34 was not used in developing Figure 6.

4.2.2 Groundwater Gradient

The groundwater gradient for the Fieldcrest Cannon site was calculated using potentiometric head data from soil borings SB-37 and SB-18. These data points were chosen because they represent the highest and lowest potentiometric head elevations, with excluding the data from SB-34. The groundwater gradient was calculated as follows:

$$\begin{aligned} \text{gradient} &= \frac{(\text{SB-37 potentiometric head elevation} - \text{SB-18 potentiometric head elevation})}{\text{distance}} \\ &= \frac{26.08 \text{ feet}}{1005 \text{ feet}} = .0260 \text{ feet per foot} \end{aligned}$$

4.2.3 Direction of Groundwater Flow

ENSCI utilized a computer model called WaterVel, marketed by InSitu, Inc. in Laramie, Wyoming to calculate the direction of groundwater flow. The WaterVel program provides a least square fit to a plane (the groundwater table), provided that the program is supplied with a minimum of three points with known elevations.

To collect data for the calculation, a site survey was generated by ENSCI. The survey provided the X, Y, and Z coordinates for the soil borings. The X and Y coordinates were based on a temporary local grid system developed for the proposed site, with a positive

Table 1: Static Water Level Data
(Data collected December 22, 1992)

Soil Boring Number	Piezometer Head Elevation (feet)	Depth to Groundwater (feet)	Potentiometric Head Elevation (feet)
SB-18	770.06	12.05	758.01
SB-19	772.88	9.32	763.56
SB-20	776.11	6.28	769.83
SB-21	774.96	7.24	767.72
SB-22	789.01	12.38	776.63
SB-23	795.61	17.95	777.66
SB-24	777.10	2.44	774.66
SB-25	776.86	1.90	774.96
SB-26	795.35	18.50	776.85
SB-27	799.45	20.02	779.43
SB-28	783.03	6.51	776.52
SB-29	801.76	23.10	778.66
SB-30	794.73	16.73	778.00
SB-31	794.88	17.04	777.84
SB-32	810.61	31.23	779.38
SB-33	796.92	15.92	781.00
SB-34	798.53	7.84	790.69
SB-35	806.45	25.06	781.39
SB-36	805.64	23.13	782.51
SB-37	806.29	22.20	784.09
SB-38	807.40	*	*

* not determined

Y-axis parallel to true north. The Z coordinates were determined by measuring the elevation of the tops of the soil borings with respect to the Z axis, as discussed above.

To run the WaterVel program, ENSCI created a data file consisting of data triplets (X, Y, and Z data). The X and Y data consist of the coordinates of the various piezometers as they were calculated during the survey. The Z data consist of potentiometric head elevations for the various piezometers with respect to the Z-axis (see Table 1).

The direction of groundwater flow was calculated for several data subsets and is summarized in Table 2.

Table 2: Groundwater Flow Directions

Soil Boring Data Sets	Direction of Groundwater Flow (compass heading in degrees)
All borings except SB-34	255.4
SB-27, SB-28, SB-29, SB-33, SB-35, SB-36, SB-37	296.2
SB-18, SB-19, SB-20, SB-21, SB-22, SB-23, SB-25, SB-28	240.3

As illustrated in Table 2, the direction of groundwater flow, based on the depth to groundwater data for all soil borings except SB-34, lies at a compass bearing of 255.4 degrees (west-southwest, see Figure 6). Groundwater flow in the eastern part of the investigation area lies at a compass bearing of 296.2 degrees (west-northwest). Groundwater flow in the western part of the area lies at a compass bearing of 240.3 degrees (west-southwest). These calculations indicate that groundwater flow is toward Lumber Yard Branch.

4.2.4 Seasonal High Groundwater Table

Evidence of waterlogging above the static water table was found in several soil borings, as indicated by gray to green colors. The highest zone of gleying was noted in soil and clean fill within 3 to 20 feet of the land surface. Soil exhibited gray colors, which most likely indicate slowly permeable subsoils. Similar soil conditions were documented in the August 1992 geotechnical report. Clean fill exhibited greenish to gray colors that most

likely represent the conditions where the fill was obtained. As such, gleying in soil and clean fill is not believed to be associated with a seasonal high groundwater table.

Gleying was also present at or below the static water table in most soil borings. Thus, the seasonal high groundwater table generally corresponded to the static groundwater table. As a conservative estimate, the seasonal high groundwater table was established as 2 feet above the static groundwater level. The surface of the seasonal high groundwater table is presented in **Figure 7**.

5. Conclusions

Based on subsurface investigations, the geology of the investigated area of the Fieldcrest Cannon Plant #1 facility consists of a complex sequence of saprolite, soil, and fill materials. Groundwater is shallow and flows toward the Lumber Yard Branch to the west of the subject area. Gradients are steeper at the western part of the investigation area.

Evidence of gleying (waterlogging) was observed at depths of 3 to 20 feet in several soil borings, but the evidence was not attributed to the presence of a seasonal high water table. The gleying is believed to be attributable to slow permeability in subsoil horizons and/or to conditions where fill soil was obtained. Gleying was also noted at or below the static water table. As a result, the seasonal high groundwater table was conservatively determined to be 2 feet above the static groundwater table.

Appendix A
Technical Methods

Technical Methods

ENSCI Drilling and Sampling Procedures

Soil borings were installed with a B-40L truck-mounted drilling rig equipped with a rotary head. Borings were advanced below the ground surface with 6.5-inch outside diameter, hollow stem augers. Borings were advanced until the seasonal high water table or static groundwater table was encountered, or until auger refusal.

Soil samples were obtained using a split-spoon technique in accordance with ASTM Procedure D-1586. Continuous split-spoon samples were obtained for soil borings SB-2, SB-3, and SB-5; split spoons were obtained at 5-foot intervals for the remaining soil borings. Descriptions included documentation of color, texture, structure, mineralogy, and moisture content in accordance with American Geological Institute (AGI) standards. Colors were described using a Munsell soil color chart.

Appendix B

Field Drilling Records

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 18	LOCATION:	Fieldcrest
START DATE:	12-17-92	COMPLETED:	12-17-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	13 Feet	CASING DEPTH:	13 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
3	5	Top 10" - Saprolite, highly weathered, resembles schist, abundant mica, some feldspars, grayish brown, few grayish green areas, wet.	20	5	6	12	10
		Bottom 10" - Saprolite, light yellowish brown, weathered, abundant mica, feldspars, some quartz; moist.					
8	10	Saprolite, light gray, highly weathered, abundant mica and feldspar, trace of quartz, some horizontally banded zones exhibiting light yellowish brown color; outside of spoon wet.	20	15	14	23	18
13	15	Small amount of sample in spoon was a granite-like saprolite.	2	40+			

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) 5 DEPTH(ft) 0-5 DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) 18 DEPTH(ft) 5-13 DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND N/A BAGS OF SAND N/A
 DEPTH TO TOP SEAL N/A BENTONITE USED N/A
 BAGS OF CEMENT USED N/A

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 19	LOCATION:	Fieldcrest
START DATE:	12-16-92	COMPLETED:	12-17-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	12 Feet	CASING DEPTH:	12 Feet

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
.5	2	Fill; crush and run stone.					
3	5	Fill? Reddish yellow clay, some horizontal yellowish red bands, 1" horizontal band of white clay, few dark gray mottles, some mica and feldspars, traces of quartz, layer - cake appearance, possible fill, dry.	10"	2	1	1	2
8	10	Light gray clay, common white and reddish yellow mottles, trace feldspar and quartz, some mica, firm yet slightly plastic, spoon wet.	8"	1	2	2	3
		Total Depth 12 Feet.					

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) 2 DEPTH(ft) 0-2 DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) 10 DEPTH(ft) 2-12 DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND N/A BAGS OF SAND N/A
 DEPTH TO TOP SEAL N/A BENTONITE USED N/A
 BAGS OF CEMENT USED N/A

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 21	LOCATION:	Fieldcrest
START DATE:	12-16-92	COMPLETED:	12-16-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	18 Feet	CASING DEPTH:	18 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
3	5	Saprolite, Primary colors gray and white, highly weathered, resembles granite, some relic rock structure, vertical fractures filled with relic feldspars, abundant feldspars and mica, occasional quartz; bottom of split spoon sample exhibits a light red tint, samples were dry.	15"				press
8	10	Saprolite, yellowish red silty clay, weathered, vertical fractures filled with black material (MnO ₂), abundant highly weathered mica, some feldspar, moist.	18"				press

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND N/A BAGS OF SAND N/A
 DEPTH TO TOP SEAL N/A BENTONITE USED N/A
 BAGS OF CEMENT USED N/A

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 22	LOCATION:	Fieldcrest
START DATE:	12-16-92	COMPLETED:	12-16-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	28 Feet	CASING DEPTH:	25 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
3	5	Fill, light gray clay to slightly sandy clay, some organics in top 10" mixed with asphalt and brick, some quartz and feldspar, top wet - bottom dry, few light gray zones.	24"	4	10	13	15
8	10	Fill? Pale olive, silty sand, abundant mica, some feldspars, loose consistency, dry.	24"	4	5	8	10
13	15	Saprolite, olive, highly weathered, resembles schist, some light red in fractured zones (horizontal fracture), 1" horizontal fracture filled with weathered feldspars, abundant mica, highly weathered; silky texture; dry, moderately firm.	20"	9	11	17	20

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND _____ N/A _____ BAGS OF SAND _____ N/A _____
 DEPTH TO TOP SEAL _____ N/A _____ BENTONITE USED _____ N/A _____
 BAGS OF CEMENT USED _____ N/A _____

FIELD DRILLING RECORD

BORING #	SB - 22 (continued)	LOCATION:	Fieldcrest
START DATE:	12-16-92	COMPLETED:	12-16-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	28 Feet	CASING DEPTH:	28 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
18	20	Similar to 13-15' interval. Few horizontal fractures filled with black material; few dark greenish gray halos around micas, moist.		4	8	18	25
22		Cuttings very wet.					
23	25	Saprolite, pale olive, highly weathered, resembles granite/schist. Abundant mica, horizontal foliation, few greenish halos around micas, abundant feldspars, few faint reddish yellow mottles, wet.					
		Total Depth 28 Feet					

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) 10 DEPTH(ft) 0-10 DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) 15 DEPTH(ft) 10-25 DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND N/A BAGS OF SAND N/A
 DEPTH TO TOP SEAL N/A BENTONITE USED N/A
 BAGS OF CEMENT USED N/A

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 23	LOCATION:	Fieldcrest
START DATE:	12-16-93	COMPLETED:	12-16-93
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	23 Feet	CASING DEPTH:	23 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
3	5	Light reddish gray, silty clay to clay; reddish yellow mottles, moderately firm; few highly weathered feldspars, abundant mica; dry.	24"	6	8	7	10
8	10	Saprolite, yellow; highly weathered, resembles schist/granite; silty clay; few gray mottles, abundant mica and feldspar; some quartz; moist; friable.	20"	5	6	8	9
13	15	Top 5" - Saprolite, similar to 8 - 10" interval. Bottom 15" - Saprolite. Dark gray to dark greenish gray, highly weathered; resembles schist; abundant mica, moist; friable.	20"	6	6	6	8

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND N/A BAGS OF SAND N/A
 DEPTH TO TOP SEAL N/A BENTONITE USED N/A
 BAGS OF CEMENT USED N/A

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 25	LOCATION:	Fieldcrest
START DATE:	12-17-92	COMPLETED:	12-17-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	18 Feet	CASING DEPTH:	18 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
	2	Fill, gray, sandy clay.					
3	5	Fill, gray, sandy clay, abundant quartz, some feldspars, wet; loose consistency.	8"				press
8	10	Saprolite, highly weathered, resembling granite/schist. Gray and white (primary colors), abundant feldspar, highly weathered micas with greenish gray halos, few red stained zones, loose; friable, wet.	15"				press
13 1/2	15	Saprolite, highly weathered, resembles granite, gray and white (primary colors), abundant feldspars and micas, some quartz, few red stained zones, mica rich areas	10'				press

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) _____ MATERIAL _____
 SCREEN LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) _____ MATERIAL _____
 DEPTH TO TOP OF SAND _____ BAGS OF SAND _____
 DEPTH TO TOP SEAL _____ BENTONITE USED _____
 BAGS OF CEMENT USED _____

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 26	LOCATION:	Fieldcrest
START DATE:	12-17-92	COMPLETED:	12-17-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	28 Feet	CASING DEPTH:	28 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
3	5	Top 18". Fill, light red gravelly, sandy clay; abundant zones very dark gray to dark greenish gray, few greenish gray zones, firm, very wet. Bottom 6". Fill, yellow sandy clay, abundant quartz, feldspar, some mica, moderately firm, dry.	24"	1	2	6	7
		Top 5"					
8	10	Yellowish red, silty clay with very pale brown mottles, few gray zones; some feldspar and quartz, moderately firm; moist. Bottom 12" Saprolite; light gray, resembles schist or possibly granite, silky texture, abundant mica and feldspar, trace quartz,	15"	4	4	4	4

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND N/A BAGS OF SAND N/A
 DEPTH TO TOP SEAL N/A BENTONITE USED N/A
 BAGS OF CEMENT USED N/A

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 26(continued)	LOCATION:	Fieldcrest
START DATE:	12-17-92	COMPLETED:	12-17-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	28 Feet	CASING DEPTH:	28 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
		loose; moist.					
13	15	Saprolite, highly weathered, yellowish red, silty clay, abundant mica and feldspar, moderately firm, slightly moist.	24"	4	5	6	6
18	20	Saprolite, highly weathered; schistose; light gray, vertically oriented reddish yellow stains, abundant micas, some feldspars, firm; wet.	24"	2	1	1	1
23	25	Saprolite, white and gray (primary colors), resembles granite, abundant feldspars and micas, some micas very highly weathered with black/green appearance, trace quartz, wet, loose.	20"	8	10	11	8

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) 13 DEPTH(ft) 0-13 DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) 15 DEPTH(ft) 13-28 DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND N/A BAGS OF SAND N/A
 DEPTH TO TOP SEAL N/A BENTONITE USED N/A
 BAGS OF CEMENT USED N/A

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 27	LOCATION:	Fieldcrest
START DATE:	12-17-92	COMPLETED:	12-17-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	33 Feet	CASING DEPTH:	33 Feet

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
3	5	Fill. Grayish brown silty clay, no evident rock structure, abundant relic feldspars, mica, trace quartz, firm, wet.	24"	8	8	6	12
8	10	Fill. Light gray, sandy silt, common yellow mottles/streaks. Very highly weathered feldspar, trace mica and quartz, friable - wet.	24"	5	8	10	11
13	15	Fill. Light brownish gray sandy clay to clay; common light gray mottles; two 1" thick horizontal red clay bands containing plant material; relic micas and feldspars; moist; moderately firm.	24"	5	6	7	8

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) 13 DEPTH(ft) 0-13 DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) 20 DEPTH(ft) 13-33 DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND N/A BAGS OF SAND N/A
 DEPTH TO TOP SEAL N/A BENTONITE USED N/A
 BAGS OF CEMENT USED N/A

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 27	LOCATION:	Fieldcrest
START DATE:	12-17-92	COMPLETED:	12-17-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	33 Feet	CASING DEPTH:	33 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
18	20	Fill. Similar to 13-15' interval; still evidence of fibrous plant material, moist; firm.	12"	5	13	13	12
23	25	Saprolite; resembles granite. Gray and white (primary colors), fractures filled with black material (MnO2), few yellowish red stains around fractured areas, abundant feldspars and micas, trace quartz, moist, friable; firm.	24"	13	14	15	23
28	30	Saprolite, resembles granite. Gray and white (primary colors), few yellowish red stains in fractured areas, abundant feldspars and mica, wet, firm.	18'	13	22	40	+

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND N/A BAGS OF SAND N/A
 DEPTH TO TOP SEAL N/A BENTONITE USED N/A
 BAGS OF CEMENT USED N/A

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 28	LOCATION:	Fieldcrest
START DATE:	12-18-92	COMPLETED:	12-18-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	15 Feet	CASING DEPTH:	15 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
3	5	Fill; light gray, sandy clay; some feldspars and mica, trace quartz, some roots and plant material; firm; dry.	10"	12	13	14	16
8	10	Fill; dark greenish gray sandy clay with few reddish yellow mottles; some feldspars, mica, quartz and plant material, firm; wet.	10"	1	2	2	1
13	15	Fill; coarse sand, gray; Some glass found in spoon; very wet; loose.	12'	1	2	2	
		Total Depth 15 Feet.					
		Last 3 Feet of hole.					

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) 2 DEPTH(ft) 0-2 DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) 10 DEPTH(ft) 2-12 DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND N/A BAGS OF SAND N/A
 DEPTH TO TOP SEAL N/A BENTONITE USED N/A
 BAGS OF CEMENT USED N/A

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 29	LOCATION:	Fieldcrest
START DATE:	12-18-92	COMPLETED:	12-18-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	33 Feet	CASING DEPTH:	33 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
3	5	Light gray clay to silty clay, with few to common reddish yellow mottles, abundant mica, feldspar, quartz, firm, dry.	24"	7	12	12	17
8	10	Top 18". Saprolite; highly weathered; yellow, silty clay; abundant, highly weathered micas; moderately weathered feldspars; trace quartz; loose; dry. Bottom 4". Saprolite; brown (primary color), foliated silky texture, abundant mica, trace feldspar; friable - loose; dry.	22"	4	8	7	6
13	15	Saprolite. Gray (primary color), resembles granite/schist; abundant mica and feldspar, some quartz,	24"	3	4	4	4

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND _____ N/A BAGS OF SAND _____ N/A
 DEPTH TO TOP SEAL _____ N/A BENTONITE USED _____ N/A
 BAGS OF CEMENT USED _____ N/A

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 29(continued)	LOCATION:	Fieldcrest
START DATE:	12-18-92	COMPLETED:	12-18-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	33 Feet	CASING DEPTH:	33 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
		dry; friable - loose.					
18	20	Saprolite, white and gray to black (primary colors), weathered, resembles granite; abundant feldspar, mica, and quartz, some reddish yellow staining around relic feldspars, some black staining around mica or feldspar rich zones, loose, friable, dry.	24"	10	10	12	9
23	25	As above.	24"	8	7	7	10
28	30	Saprolite, gray (primary color), weathered, resembles schist/granite, some very highly weathered micas; feldspar and quartz, firm, very wet.	24"	15	12	15	12
		Total Depth 33 Feet.					

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) 13 DEPTH(ft) 0-13 DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) 20 DEPTH(ft) 13-33 DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND N/A BAGS OF SAND N/A
 DEPTH TO TOP SEAL N/A BENTONITE USED N/A
 BAGS OF CEMENT USED N/A

ENSUCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 30	LOCATION:	Fieldcrest
START DATE:	12-15-92	COMPLETED:	12-15-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	28 Feet	CASING DEPTH:	28 Feet

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO	Color, texture, structure, consistency, etc.	REC	6"	12"	18"	24"

3	5	Saprolite? Gray clay to slightly silty clay; reddish yellow mottles along vertical fractures; abundant mica, some feldspars, trace quartz, dry, firm.	24"				press
8	10	Saprolite? Light gray clay, few red mottles, few areas of black stains, trace vertical fractures, some mica, quartz, feldspar, dry, firm.	24"				press
13	15	Saprolite, light red to light reddish gray; highly weathered, abundant quartz and feldspars, some highly weathered micas; moist, firm.	24"				press

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND N/A BAGS OF SAND N/A
 DEPTH TO TOP SEAL N/A BENTONITE USED N/A
 BAGS OF CEMENT USED N/A

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 32	LOCATION:	Fieldcrest
START DATE:	12-14-92	COMPLETED:	12-14-92
GEOLOGIST:	S. Stadelman	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	33 Feet	CASING DEPTH:	33 Feet

DEPTH		LITHOLOGIC DESCRIPTION	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
0	3						
3	5	Soil. Bt horizon, red sandy clay loam to clay loam. Common mica. Relict rock structure; highly weathered. Common quartz, feldspar and mica. Few thin discontinuous clay films. Depth 0 - 24".	24"	5	5	6	6
8	10	Saprolite. Highly weathered; resembles granite/tonalite, yellowish red sandy clay loam; abundant feldspars, minor quartz; micaceous. Common reddish yellow mottles from 8 - 9 " interval. Depth 6 - 24".	24"	5	6	7	7
13	15	Saprolite. Moderately weathered. Resembles granite;	18'	4	5	5	5

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) _____ MATERIAL _____
 SCREEN LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) _____ MATERIAL _____
 DEPTH TO TOP OF SAND _____ BAGS OF SAND _____
 DEPTH TO TOP SEAL _____ BENTONITE USED _____
 BAGS OF CEMENT USED _____

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 32 (continued)	LOCATION:	Fieldcrest
START DATE:	12-14-92	COMPLETED:	12-14-92
GEOLOGIST:	S. Stadelman	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	33 Feet	CASING DEPTH:	33 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
		abundant quartz, dark brown staining along vertical fractures; abundant mica; micas and Fe/Mn minerals are slightly oxidized, giving the saprolite a greenish coat. Depth 0 - 18".					
18	20	Saprolite. Similar to 13-15' interval. Common reddish yellow staining increasing with depth, crushes to loamy sand; moist. Depth 0 - 20".	20"	5	4	4	4
20	25	Saprolite. Similar to 18-20' interval. Few reddish yellow to yellow stain at 20 - 21'. Moist. Depth 0 - 20".	20"	5	6	6	7
25	28	Saprolite. Moderately weathered; resembles granite/tonalite; coarse foliation;	18"	6	7	9	10

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) _____ MATERIAL _____
 SCREEN LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) _____ MATERIAL _____
 DEPTH TO TOP OF SAND _____ BAGS OF SAND _____
 DEPTH TO TOP SEAL _____ BENTONITE USED _____
 BAGS OF CEMENT USED _____

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 33	LOCATION:	Fieldcrest
START DATE:	12-15-92	COMPLETED:	12-15-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	28 Feet	CASING DEPTH:	28 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
3	5	Top 10"					
		Fill. Light yellowish brown, silty clay, quartz-rich, wet, firm.	20"	3	4	6	5
		Bottom 10".					
		Saprolite. Weathered, reddish yellow; abundant white and pink feldspars, horizontally oriented bands of mica, some quartz, dry, firm.					
8	10	Saprolite. Gray (primary color), weathered, resembles granite/tonalite, abundant feldspars and mica in horizontal orientation, some yellow staining in these horizontal structures, dry, firm.	24"				press
13	15	Saprolite. Gray (primary color), weathered,	24"				press

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND N/A BAGS OF SAND N/A
 DEPTH TO TOP SEAL N/A BENTONITE USED N/A
 BAGS OF CEMENT USED N/A

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 34	LOCATION:	Fieldcrest
START DATE:	12-14-92	COMPLETED:	12-14-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	23 Feet	CASING DEPTH:	23 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
3	5	Light gray clay; reddish yellow mottles, abundant quartz, dry, firm.	24"	5	8	10	13
8	10	Light gray clay to silty clay with reddish yellow mottles; abundant quartz, feldspar, and mica, horizontal band of quartz; rich zone with red tint, very firm - dense; dry, becoming very hard at 11' - 12'.	24"	8	9	12	12
13	15	Top 10 Inches. Reddish yellow silty clay with light gray mottles.	20'	2	2	3	3
		Bottom 10 Inches. Dark gray, silty clay; firm - plastic, wet.					

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND N/A BAGS OF SAND N/A
 DEPTH TO TOP SEAL N/A BENTONITE USED N/A
 BAGS OF CEMENT USED N/A

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 35	LOCATION:	Fieldcrest
START DATE:	12-14-92	COMPLETED:	12-14-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	28 Feet	CASING DEPTH:	28 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
3	5	Fill. red, clay to silty clay, abundant quartz, some feldspar, trace mica, dry, firm.	24"	3	6	8	8
8	10	Saprolite. Light red, highly weathered, resembles granite, abundant relic feldspars and micas, some quartz.	24"	5	6	6	7
13	15	Saprolite. Gray (primary color), resembles granite; feldspar, mica, trace quartz, no evident rock structure, dry, firm.	24"	5	4	7	7
18	20	Similar to 13 - 15' interval.	20"	5	6	6	7
23	25	Saprolite. Gray and white (primary colors), resembles granite; feldspar and mica, wet, firm.					
		Total Depth 28 Feet.					

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) 8 DEPTH(ft) 0-8 DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) 20 DEPTH(ft) 8-28 DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND N/A BAGS OF SAND N/A
 DEPTH TO TOP SEAL N/A BENTONITE USED N/A
 BAGS OF CEMENT USED N/A

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 36	LOCATION:	Fieldcrest
START DATE:	12-15-92	COMPLETED:	12-15-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	33 Feet	CASING DEPTH:	33 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
3	5	Red to reddish yellow silty clay to clay, abundant quartz, trace weathered feldspars, dry, firm.	24"	3	5	10	8
8	10	Saprolite. Reddish yellow, highly weathered, abundant feldspar, highly weathered mica, some quartz, dry, firm.	24"	4	7	7	6
13	15	Saprolite. Gray/white (primary colors), resembles granite, abundant feldspars (pink tint), biotite mica oriented in horizontal bands; trace quartz, dry, firm.	24"	5	7	7	8
18	20	Saprolite. Similar to 13 - 15' interval. Moist. 22 Feet cuttings wet.	24"	4	7	6	8

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND _____ N/A BAGS OF SAND _____ N/A
 DEPTH TO TOP SEAL _____ N/A BENTONITE USED _____ N/A
 BAGS OF CEMENT USED _____ N/A

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 37	LOCATION:	Fieldcrest
START DATE:	12-15-92	COMPLETED:	12-15-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	33 Feet	CASING DEPTH:	33 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
3	5	Reddish yellow clay to silty clay with reddish yellow mottles, abundant quartz, few reddish yellow stains, firm, dry.	24"	6	7	10	10
	6	Cuttings red.					
8	10	Reddish yellow silty clay to clay, red mottles, few light gray areas, some quartz and feldspar, trace mica, very firm, dry.	24"	10	21	21	23
13	15	Light gray clay to silty clay with reddish yellow mottles, some highly weathered mica and feldspar, trace quartz, firm, dry. 16 feet very hard (clay?)	24"	9	9	12	12

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND N/A BAGS OF SAND N/A
 DEPTH TO TOP SEAL N/A BENTONITE USED N/A
 BAGS OF CEMENT USED N/A

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 37 (continued)	LOCATION:	Fieldcrest
START DATE:	12-15-92	COMPLETED:	12-15-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	33 Feet	CASING DEPTH:	33 Feet

DEPTH		LITHOLOGIC DESCRIPTION Color, texture, structure, consistency, etc.	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
18	20	Brownish yellow clay to sandy clay with gray mottles; 2" band of dark gray brown stained clay, relic mica, trace quartz, slightly plastic, moist.	24"	4	4	6	6
23	25	Saprolite. Light red, highly weathered, trace light gray staining, relic mica, feldspar, trace quartz, moist, firm.	24"	2	4	5	6
28	30	Saprolite, white/gray (primary colors), highly weathered, abundant micas and relic feldspars, wet.	20"	6	10	10	
Total Depth 33 Feet.							

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) 18 DEPTH(ft) 0-18 DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) 15 DEPTH(ft) 18-33 DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND N/A BAGS OF SAND N/A
 DEPTH TO TOP SEAL N/A BENTONITE USED N/A
 BAGS OF CEMENT USED N/A

ENSCI CORPORATION

FIELD DRILLING RECORD

BORING #	SB - 38	LOCATION:	Fieldcrest
START DATE:	12-14-92	COMPLETED:	12-14-92
GEOLOGIST:	T. Lennon	DRILLER:	T. Scott
DRILL METHOD:	Hollow Stem Auger	SAMPLE METHOD:	Split Spoon
BORING DIA:	6.25 Inches	CASING DIA:	2 Inches
TOTAL DEPTH:	23 Feet	CASING DEPTH:	23 Feet

DEPTH		LITHOLOGIC DESCRIPTION <small>Color, texture, structure, consistency, etc.</small>	PENETRATION TEST RESULTS				
FROM	TO		REC	6"	12"	18"	24"
3	5	Saprolite. Light gray, weathered, abundant feldspars and mica, trace quartz, wet, firm, slight sewage odor.	24"	4	3	2	1
8	10	Top 6". Saprolite, similar to 3 - 5' interval. Bottom 18". Saprolite, red clay with reddish yellow mottles, abundant feldspar, mica, trace quartz, moist, firm.	24"	15	12	13	13
13	15	Saprolite, red clay to silty clay with reddish yellow mottles, abundant feldspar and mica (highly weathered), dry, firm.	24"	5	7	9	8

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 SCREEN LENGTH(ft) _____ DEPTH(ft) _____ DIAMETER(in) 2" MATERIAL PVC
 DEPTH TO TOP OF SAND _____ N/A _____ BAGS OF SAND _____ N/A _____
 DEPTH TO TOP SEAL _____ N/A _____ BENTONITE USED _____ N/A _____
 BAGS OF CEMENT USED _____ N/A _____

